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DEPARTMENT: CSE

CLASS: BE-IV

SEAT NO : 612068

SUBJECT : MAI

BATCH : C

ASSIGNMENT -1

1. Write a program to perform addition of two 8-bit numbers

C DW ?

MOV AX,0003

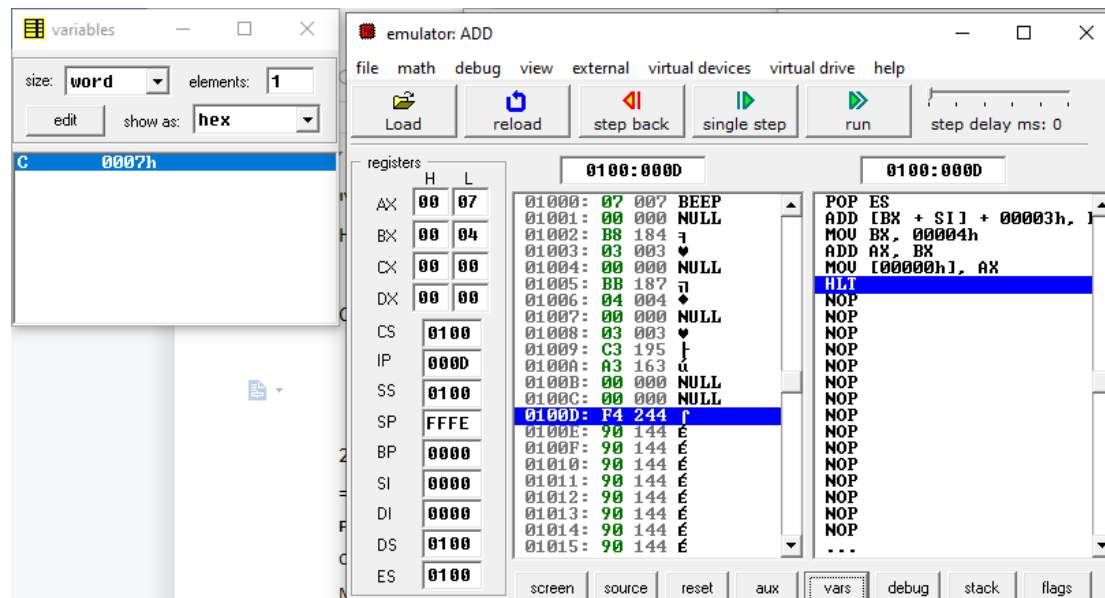
MOV BX,0004

ADD AX,BX

MOV C,AX

HLT

OUTPUT :



2. Write a program to perform subtraction of two 8-bit number

FOR A>B

C DW ?

MOV AX,0007

MOV BX,0003

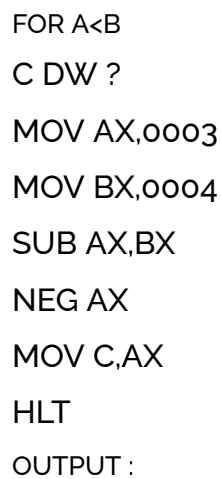
SUB AX,BX

MOV C,AX

HLT

OUTPUT :

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3) Write a program to perform multiplication of two 8-bit numbers

C DW ?

MOV AX,0007

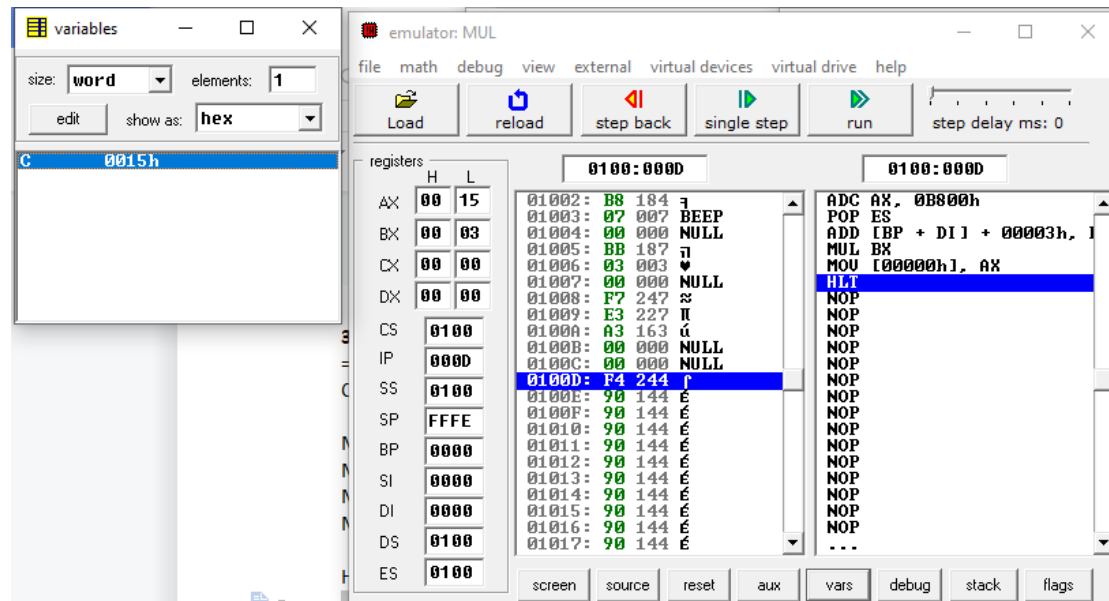
MOV BX,0003

MUL BX

MOV C,AX

HLT

OUTPUT :



4) Write a program to perform division of two 8-bit numbers

C DW ?

MOV AX,0007

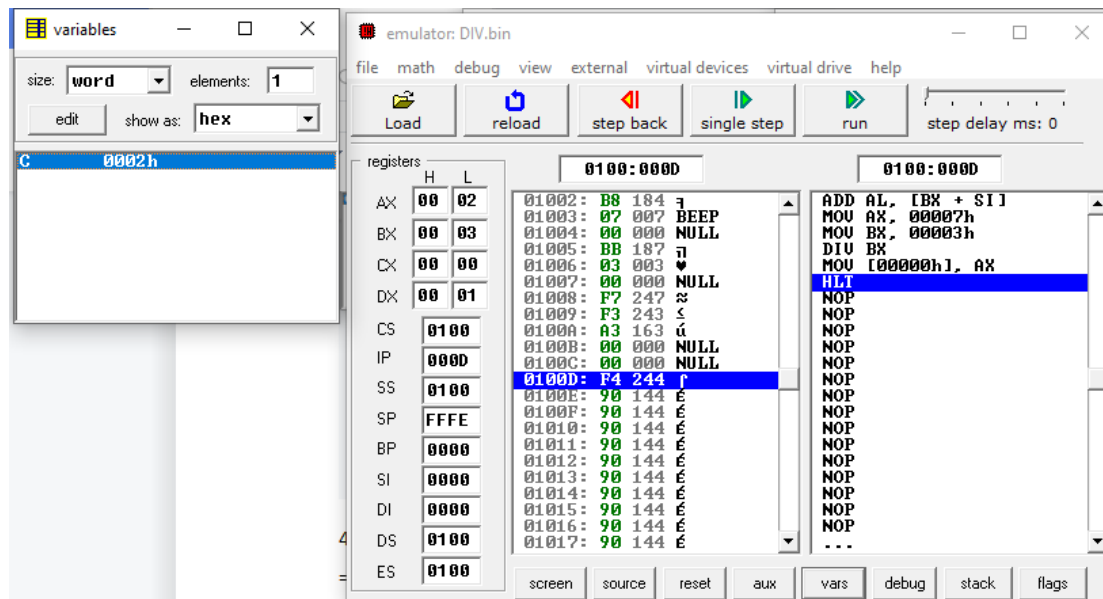
MOV BX,0003

DIV BX

MOV C,AX

HLT

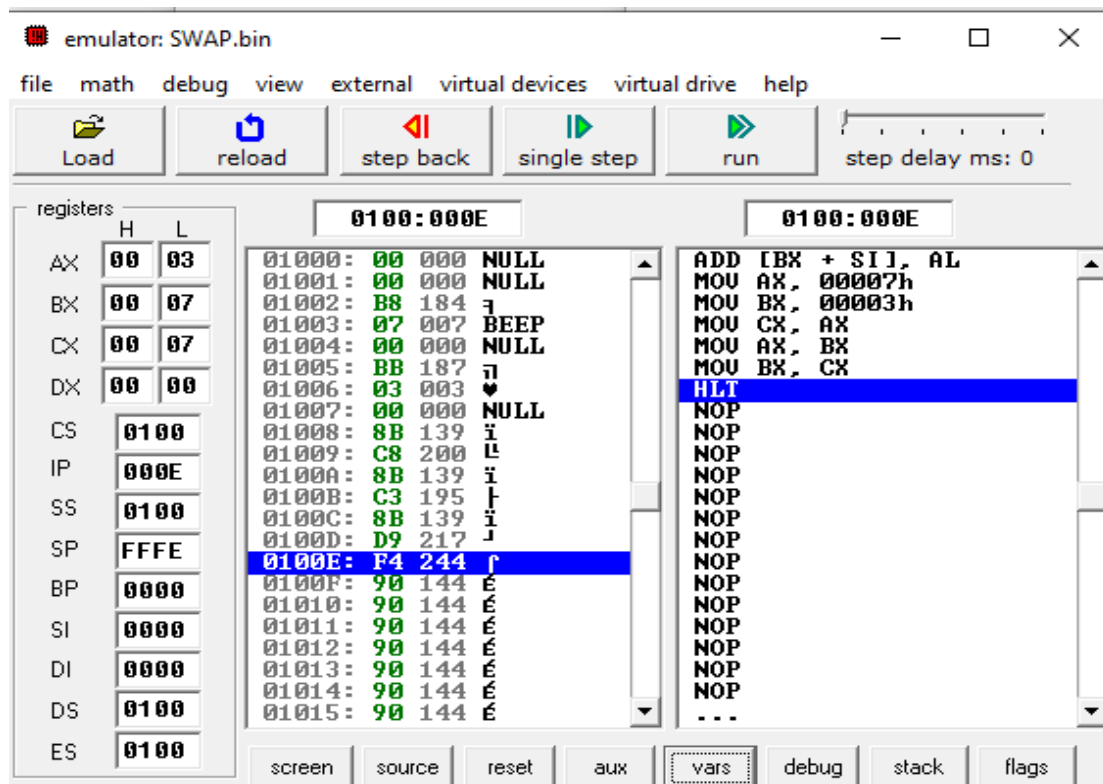
OUTPUT :



5) Write a program to interchange values of two variables

```
C DW ?
MOV AX,0007
MOV BX,0003
MOV CX,AX
MOV AX,BX
MOV BX,CX
HLT
```

OUTPUT :



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6) Write a program to find maximum number from given array of 16-bit numbers

```
MOV SI,0100h
MOV CX,0009h
MOV AL,[SI]
INC SI
LABEL:
CMP [SI],AL
JC LAB
MOV AL,[SI]
LAB:
INC SI
DEC CX
JNZ LABEL
HLT
```

OUTPUT :

The screenshot shows an x86 emulator window titled "emulator: MAXINARRAY.bin". The interface includes a menu bar (file, math, debug, view, external, virtual devices, virtual drive, help) and a toolbar with buttons for Load, reload, step back, single step, run, and a step delay slider set to 0 ms. Below the toolbar is a "registers" panel showing the state of various registers: AX (00 06), BX (00 00), CX (00 00), DX (00 00), CS (0100), IP (0013), SS (0100), SP (FFFE), BP (0000), SI (010A), DI (0000), DS (0100), and ES (0100). The main window is split into two panes. The left pane shows a memory dump starting at address 0100:0013, with values like BE 190, 00 000, 01 001, B9 185, 09 009, 00 000, 8A 138, 04 004, 46 070, 38 056, 04 004, 72 114, 02 002, 8A 138, 04 004, 46 070, 49 073, 75 117, F6 246, F4 244, 90 144, and 90 144. The right pane shows the assembly code being executed, with the instruction "HLT" highlighted in blue. Below the main window is a "Random Access Memory" panel with a table view selected, showing a memory dump from address 0100:0100 to 0100:0160. The memory dump shows a sequence of bytes, with the first few bytes being 02 03 04 05 06 01 06 06-03 00 00 00 00 00 00 00 00, followed by several lines of 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00.

Assignment 2

1. Write a program to perform addition of 2 32 – bit numbers.

N1 DW 2 DUP(?)

N2 DW 2 DUP(?)

N3 DW 2 DUP(?)

MOV N1,1234H

MOV N1+2,5678H

MOV N2,1111H

MOV N2+2,1111H

MOV AX,N1

ADD AX,N2

MOV N3,AX

MOV AX,N1+2

ADC AX,N2+2

MOV N3+2,AX

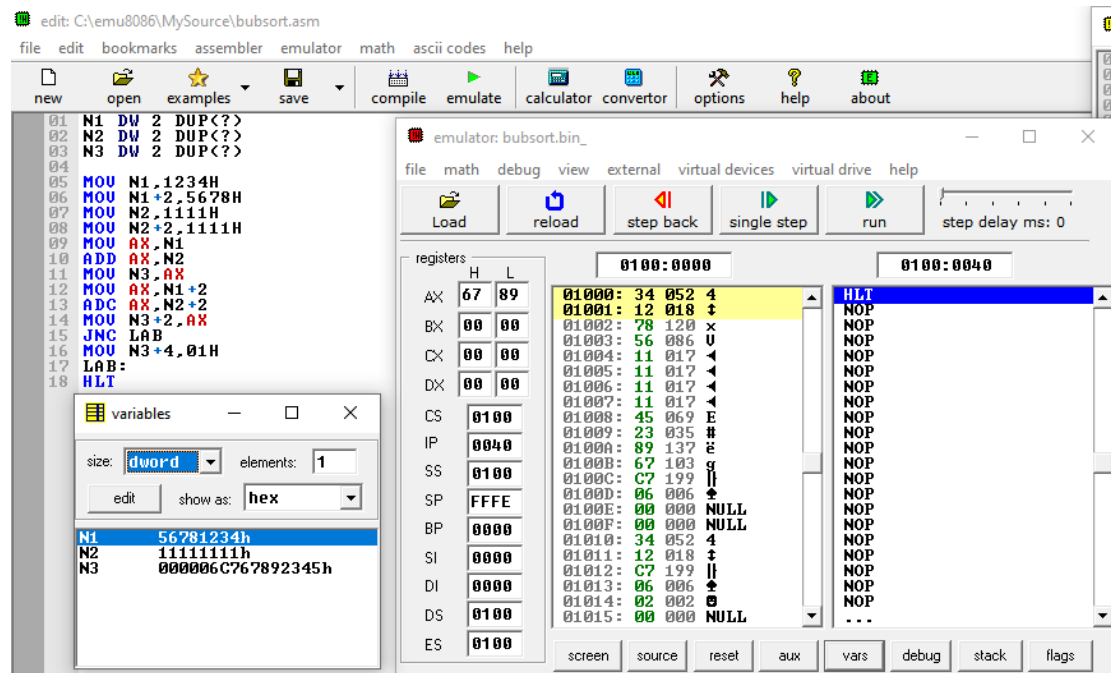
JNC LAB

MOV N3+4,01H

LAB:

HLT

OUTPUT :



2. Write a program to perform subtraction of 2 32 – bit numbers.

N1 DW 2 DUP(?)

N2 DW 2 DUP(?)

N3 DW 2 DUP(?)

MOV N1,1234H

MOV N1+2,5678H

MOV N2,1111H

MOV N2+2,1111H

MOV AX,N1

SUB AX,N2

MOV N3,AX

MOV AX,N1+2

SBB AX,N2+2

MOV N3+2,AX

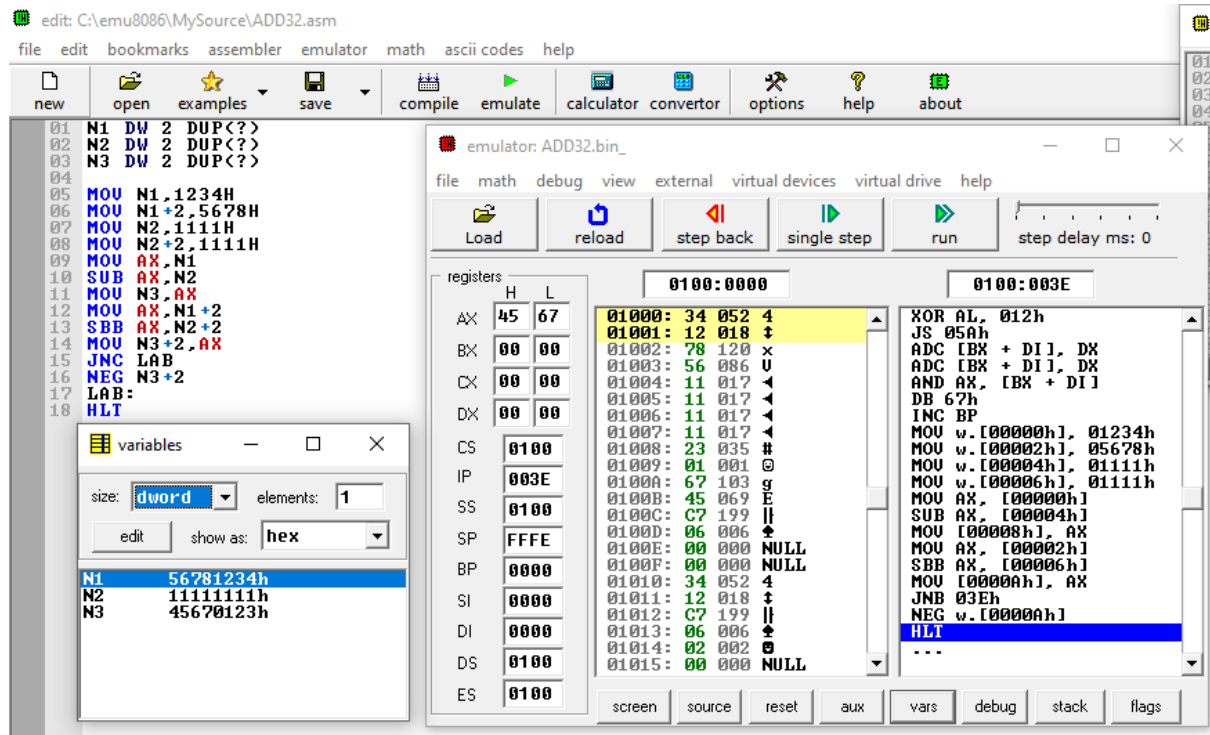
JNC LAB

NEG N3+2

LAB:

HLT

OUTPUT:



3. Write a program to perform multiplication of 2 32 – bit numbers.

N1 DW 2 DUP(?)

N2 DW 2 DUP(?)

N3 DW 4 DUP(?)

MOV N1,0F123H

MOV N2,0FF54H

MOV N2+2,0FF54H

MOV AX,N1

MUL N2

MOV N3,AX

MOV N3+2,DX

MOV AX,N1

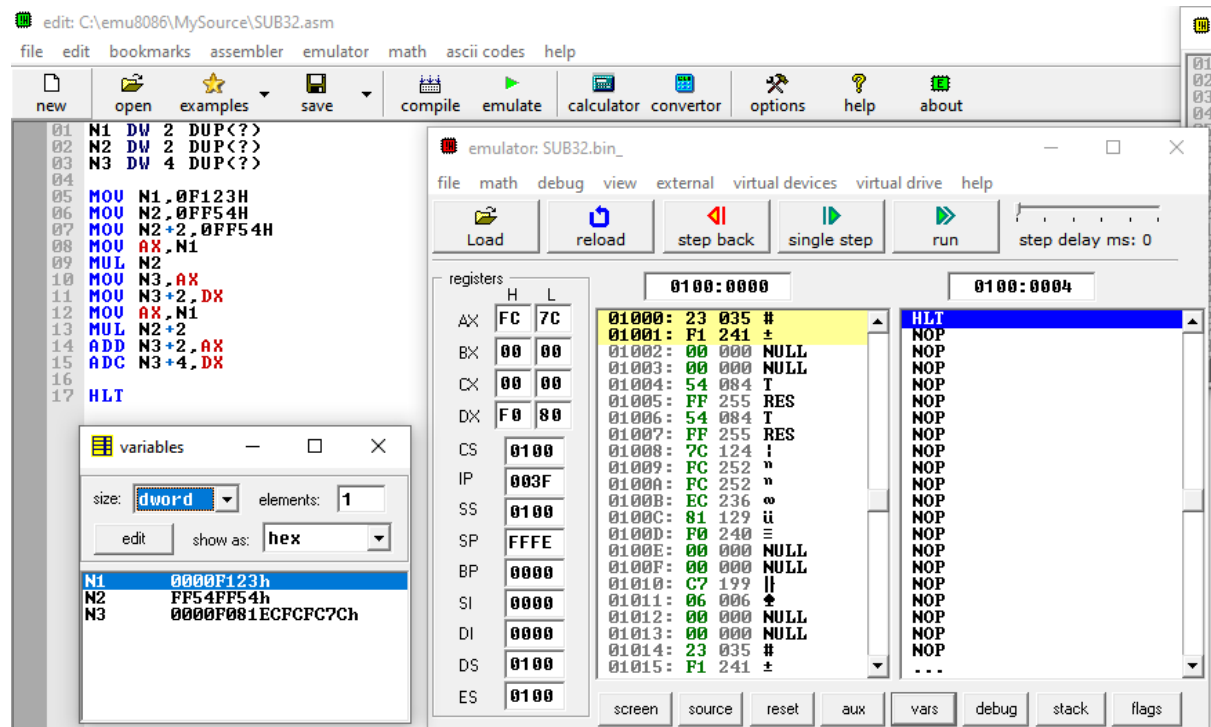
MUL N2+2

ADD N3+2,AX

ADC N3+4,DX

HLT

OUTPUT :



4. Write a program to perform division of 2 32 – bit numbers.

N1 DW 2 DUP(?)

N2 DW 2 DUP(?)

N3 DW 2 DUP(?)

MOV N1,0F123H

MOV N2,0FF54H

MOV N2+2,0FF54H

MOV AX,N1

DIV N2

MOV N3,AX

MOV N3+2,DX

MOV AX,N1

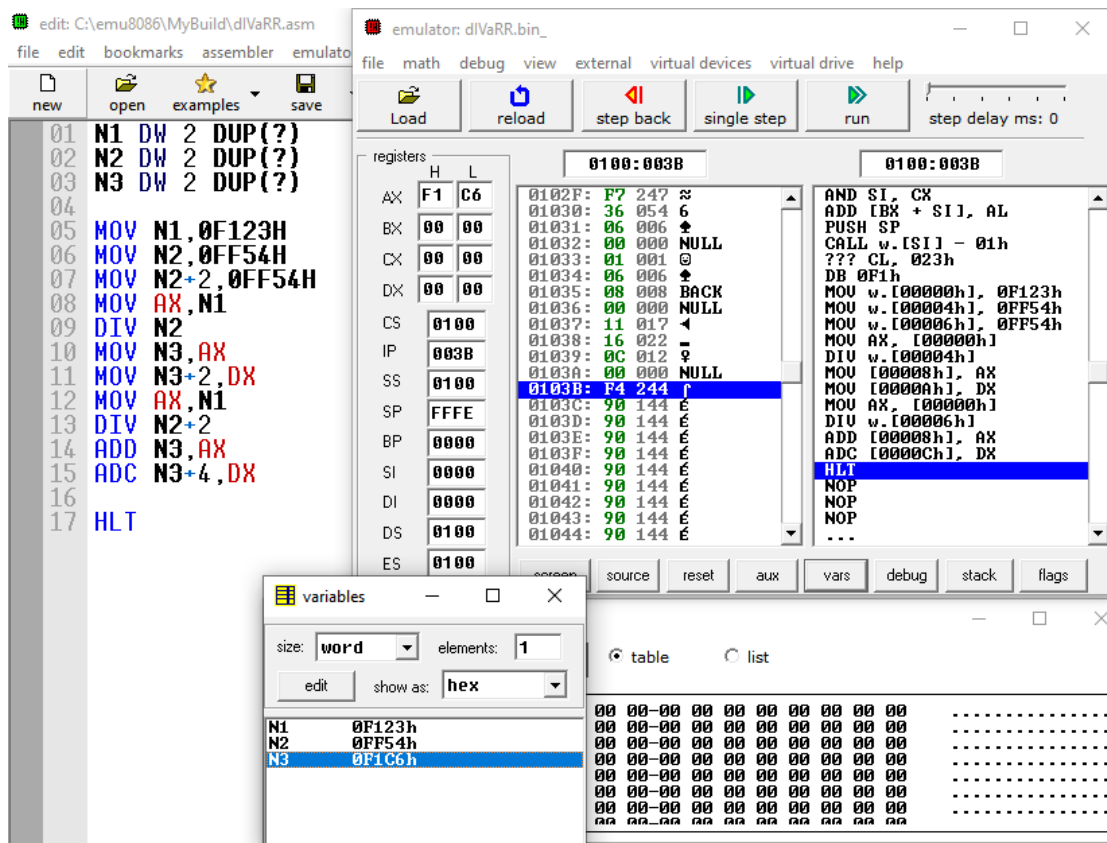
DIV N2+2

ADD N3,AX

ADC N3+4,DX

HLT

OUTPUT:



5. Write a program for addition of 2 n – word arrays.

MOV SI,3000H

MOV DI,3010H

MOV CL,05H

MOV BX,3020H

LABEL:

MOV AL,[SI]

ADD AL,[DI]

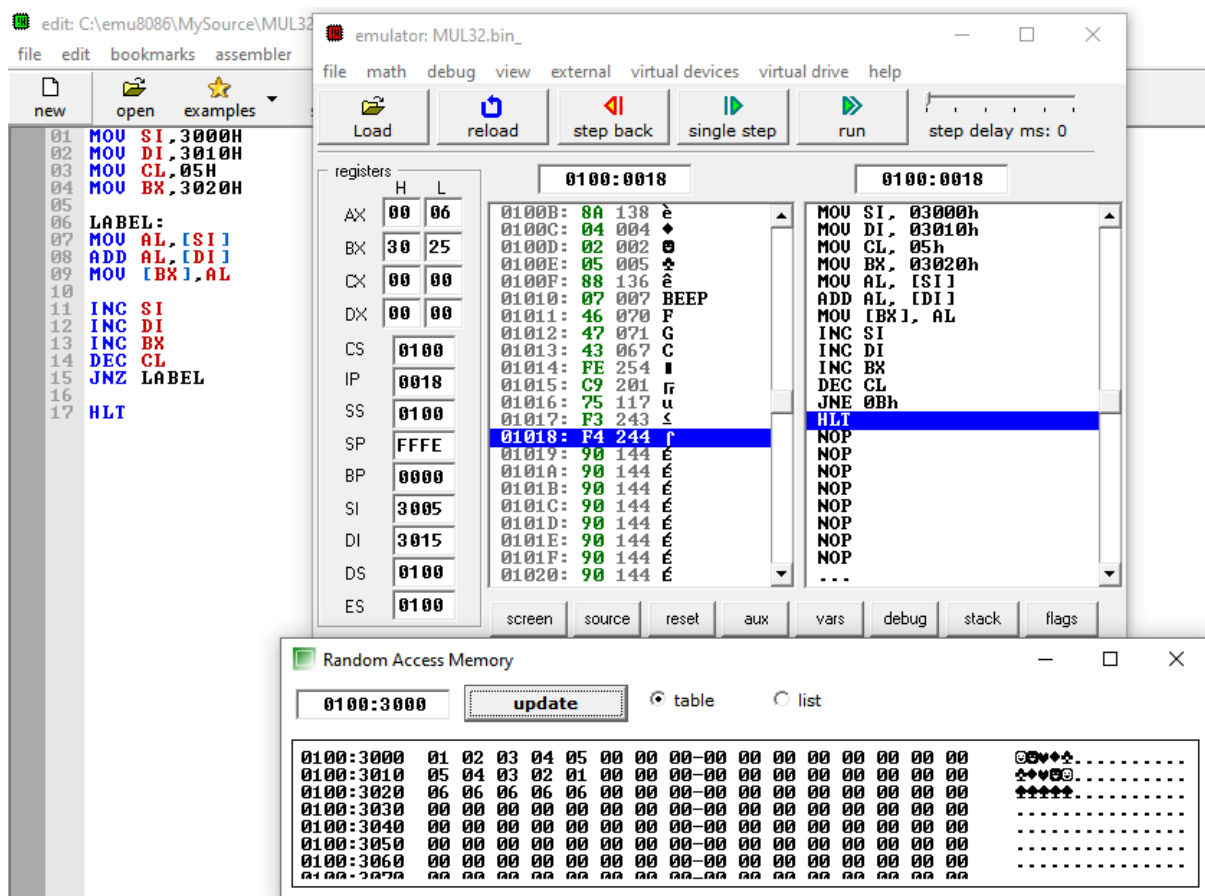
MOV [BX],AL

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```
INC SI  
INC DI  
INC BX  
DEC CL  
JNZ LABEL  
HLT
```

OUTPUT :



6. Write a program for subtraction of 2 n – word arrays.

```
MOV SI, 3000H  
MOV DI, 3010H  
MOV CL, 05H  
MOV BX, 3020H  
LABEL1:
```

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The screenshot displays the emu8086 emulator interface. The top window, titled "emulator: ADD2ARRAY.bin", shows the assembly code with labels and instructions. The bottom window, titled "Random Access Memory", shows the RAM dump.

Assembly Code (Top Window):

```

01 MOV SI, 3000H
02 MOV DI, 3010H
03 MOV CL, 05H
04 MOV BX, 3020H
05
06 LABEL1:
07 MOV AL, [SI]
08 SUB AL, [DI]
09 JB LABEL2
10 MOV [BX], AL
11 JMP LABEL3
12
13 LABEL2:
14 NEG AL
15 MOV [BX], AL
16
17 LABEL3:
18 INC SI
19 INC DI
20 INC BX
21 DEC CL
22 JNZ LABEL1
23
24 HLT

```

Registers (Bottom Window):

Register	H	L
AX	00	03
BX	30	25
CX	00	00
DX	00	00
CS	0100	
IP	0020	
SS	0100	
SP	FFFE	
BP	0000	
SI	3005	
DI	3015	
DS	0100	
ES	0100	

Random Access Memory (Bottom Window):

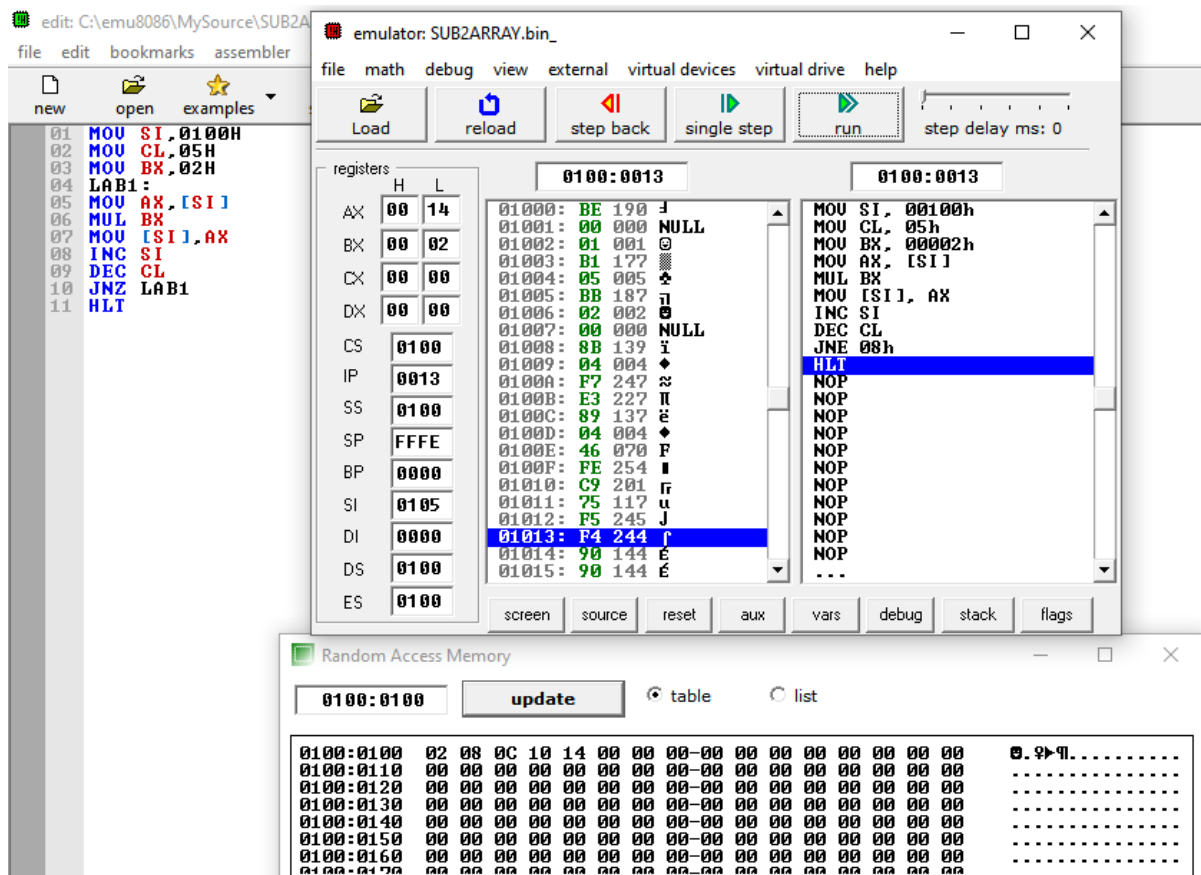
Address: 0100:3000

Address	Value	Comment
0100:3000	05 05 05 05 00 00 00 00 00 00 00 00 00 00 00 00
0100:3010	02 02 02 02 00 00 00 00 00 00 00 00 00 00 00 00
0100:3020	03 03 03 03 00 00 00 00 00 00 00 00 00 00 00 00
0100:3030	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100:3040	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100:3050	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0100:3060	00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

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- HLT

OUTPUT :



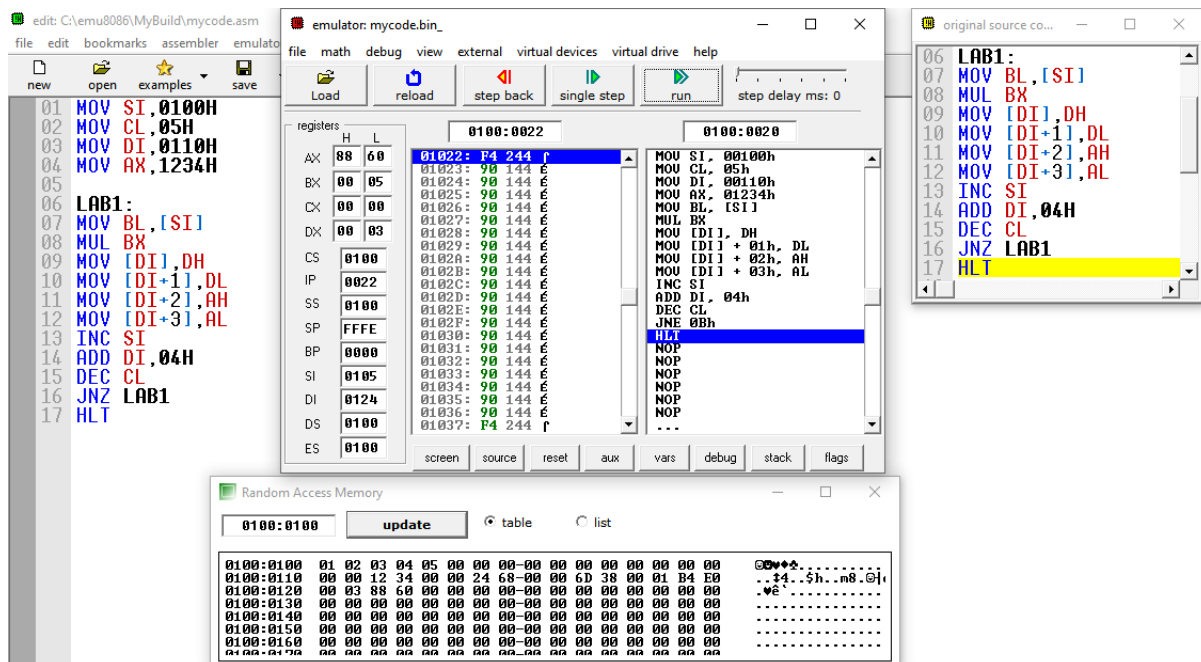
8. Write a program for multiplication of an n – byte array with a 16 – bit number.

```
MOV SI,0100H
MOV CL,05H
MOV DI,0110H
MOV AX,1234H
```

```
LAB1:
MOV BL,[SI]
MUL BX
MOV [DI],DH
MOV [DI+1],DL
MOV [DI+2],AH
MOV [DI+3],AL
INC SI
ADD DI,04H
DEC CL
JNZ LAB1
HLT
OUTPUT:
```

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9. Write a program for division of an n – byte array with a 8– bit number.

MOV SI,0100H

MOV BX,2H

MOV CL,05H

LAB1:

MOV AL,[SI]

DIV BX

MOV [SI],AL

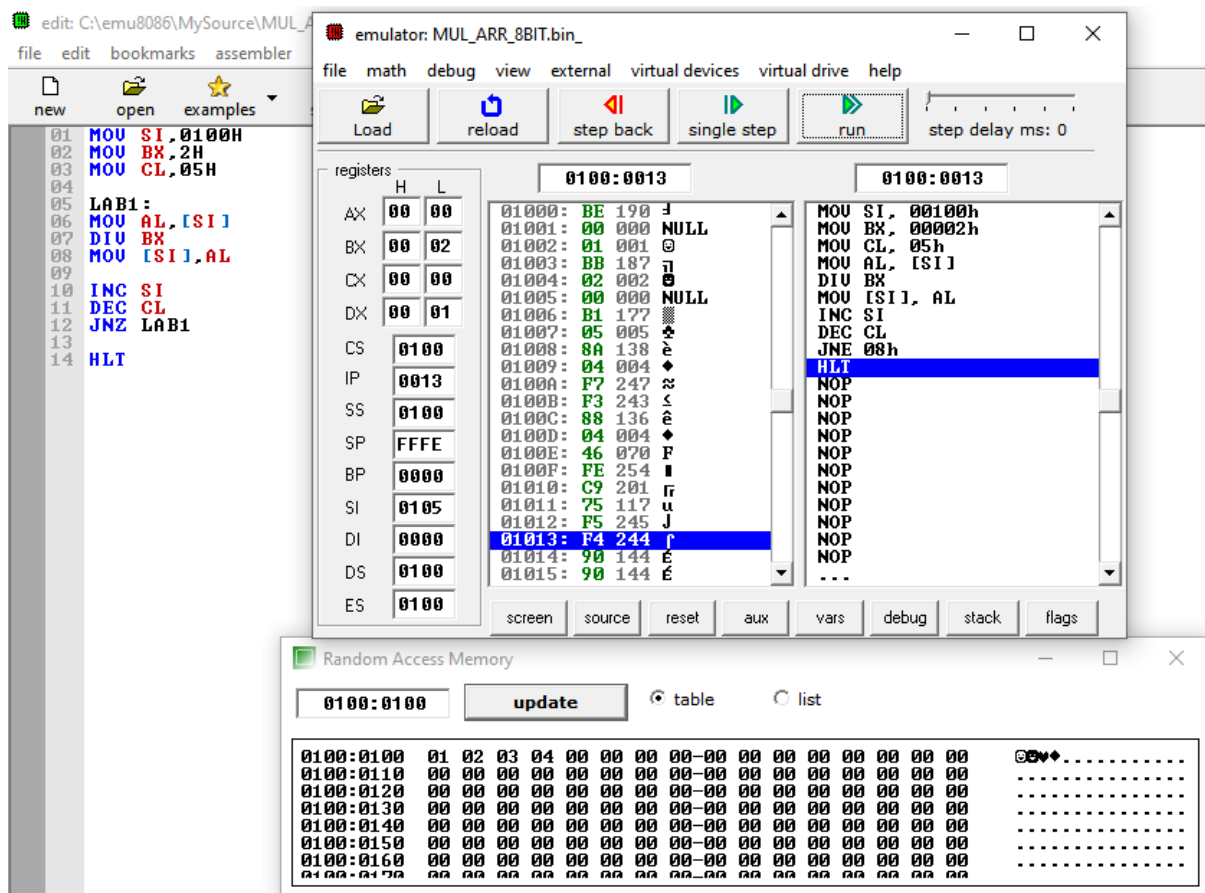
INC SI

DEC CL

JNZ LAB1

HLT

OUTPUT :



10. Write a program for division of an n – byte array with a 16 – bit number.

```

MOV SI,0100H
MOV CL,05H
MOV DI,0110H
MOV AX,1234H

```

```

LAB1:
MOV BX,[SI]
DIV BX
MOV [DI],AH
MOV [DI+1],AL
INC SI
INC SI
INC DI

```

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HLT

The screenshot shows the MyCode IDE interface. The main window displays assembly code with line numbers 01 to 17. The code includes instructions like MOV, DIV, INC, DEC, JNZ, and HLT. The registers window shows the current state of various registers, including AX, BX, CX, DX, CS, IP, SS, SP, BP, SI, DI, DS, and ES. The memory window shows the current address range (0100:0100) and the contents of memory cells.

Assembly Code:

```

01 MOV SI, 0100H
02 MOV CL, 05H
03 MOV DI, 0110H
04 MOV AX, 1234H
05
06 LAB1:
07 MOV BX, [SI]
08 DIV BX
09 MOV [DI], AH
10 MOV [DI+1], AL
11 INC SI
12 INC SI
13 INC DI
14 INC DI
15 DEC CL
16 JNZ LAB1
17 HLT

```

Registers:

Register	H	L
AX	00	B9
BX	50	50
CX	00	00
DX	2E	B2
CS	0100	
IP	001C	
SS	0100	
SP	FFFE	
BP	0000	
SI	010A	
DI	011A	
DS	0100	
ES	0100	

Memory:

Address	Value
0100:0100	10 10 20 20 30 30 40 40-50 50 00 00 00 00 00 00
0100:0110	00 01 11 0E A0 BA 38 82-00 B9 00 00 00 00 00 00
0100:0120	00 00 00 00 00 00 00 00-00 00 00 00 00 00 00
0100:0130	00 00 00 00 00 00 00 00-00 00 00 00 00 00 00
0100:0140	00 00 00 00 00 00 00 00-00 00 00 00 00 00 00
0100:0150	00 00 00 00 00 00 00 00-00 00 00 00 00 00 00
0100:0160	00 00 00 00 00 00 00 00-00 00 00 00 00 00 00

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ASSIGNMENT - 3

1. Write a program to count occurrences of a number in a given n – word array.

```
MOV SI,0100H
```

```
MOV CL,0AH
```

```
OCCURANCE DW ?
```

```
MOV AL,04H
```

```
LAB2:
```

```
CMP AL,[SI]
```

```
JNZ LAB1
```

```
INC OCCURANCE
```

```
LAB1:
```

```
INC SI
```

```
DEC CL
```

```
JZ LAB3
```

```
JMP LAB2
```

```
LAB3:
```

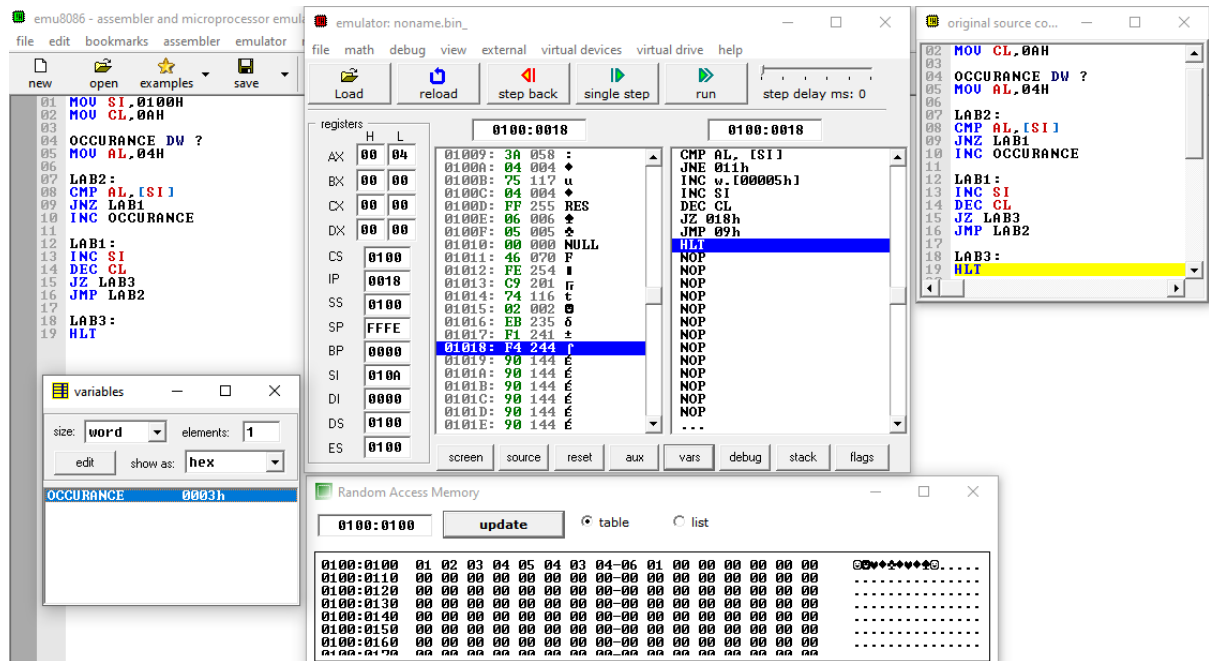
```
HLT
```

```
OUTPUT :
```

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2. Write a program to sort the given n – word array in ascending order.

MOV BX,09H

MOV DX,0H

LABEL3:

MOV SI,3000H

MOV CX,BX

LABEL:

MOV AL,[SI]

MOV AH,[SI+1]

INC DX

CMP AL,AH

JC LABEL1

MOV [SI],AH

MOV [SI+1],AL

LABEL1:

INC SI

DEC CX

JNZ LABEL

DEC BX

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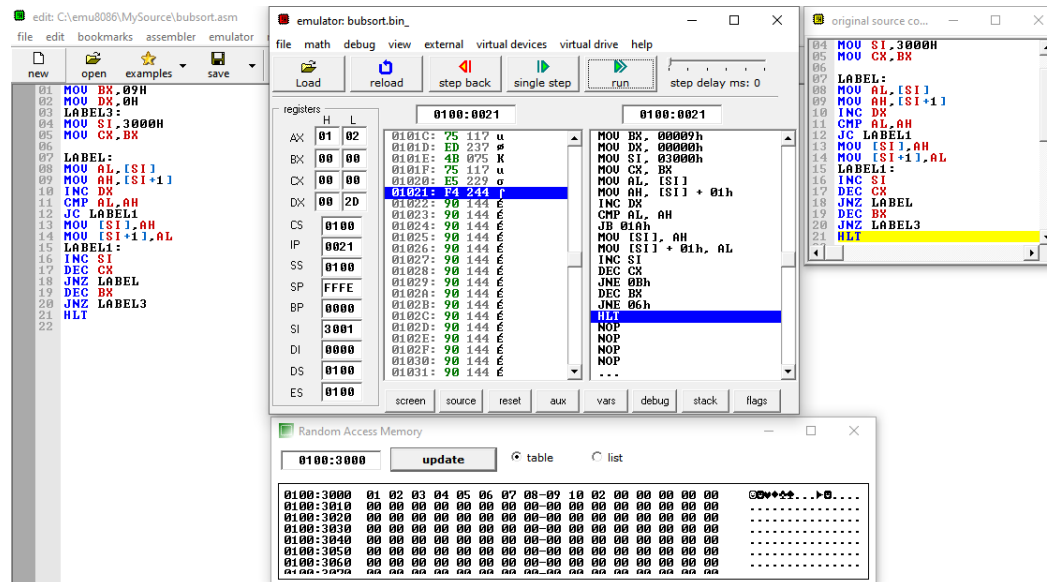
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JNZ LABEL3

HLT

OUTPUT :



3. Write a program to sort the given n – word array in descending order.

MOV BX,09H

MOV DX,0H

LABEL3:

MOV SI,3000H

MOV CX,BX

LABEL:

MOV AL,[SI]

MOV AH,[SI+1]

INC DX

CMP AL,AH

JNC LABEL1

MOV [SI],AH

MOV [SI+1],AL

LABEL1:

INC SI

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DEC CX

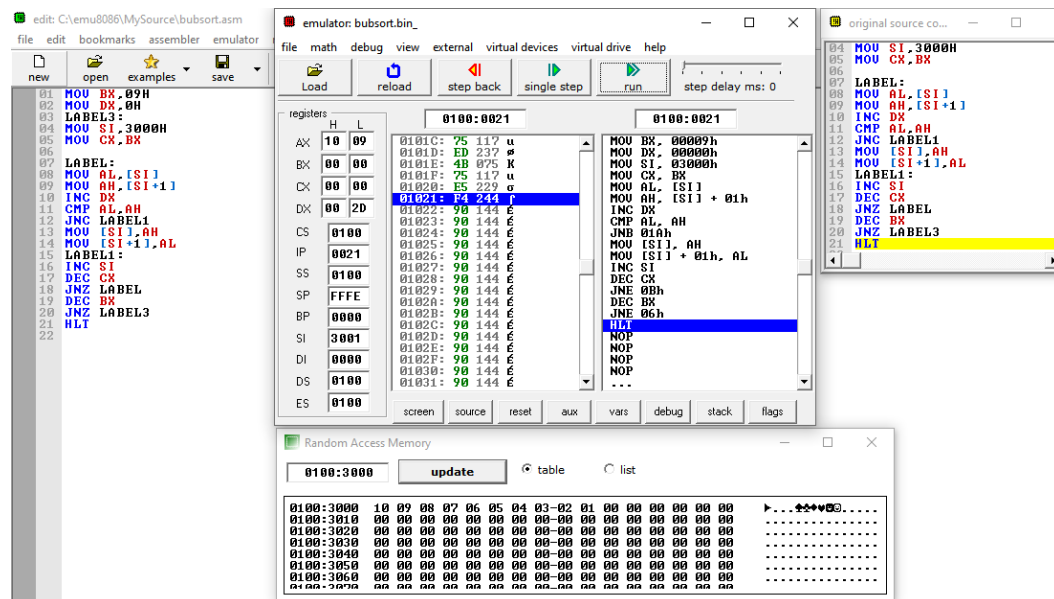
JNZ LABEL

DEC BX

JNZ LABEL3

HLT

OUTPUT :



4. Write a program to find cube of a word.

MOV BX,50H

MOV CL,03H

CUBE DW 2 DUP(?)

MOV AX,01H

LAB1:

MUL BX

MOV CUBE,AX

MOV CUBE+2,DX

DEC CL

JZ LAB2

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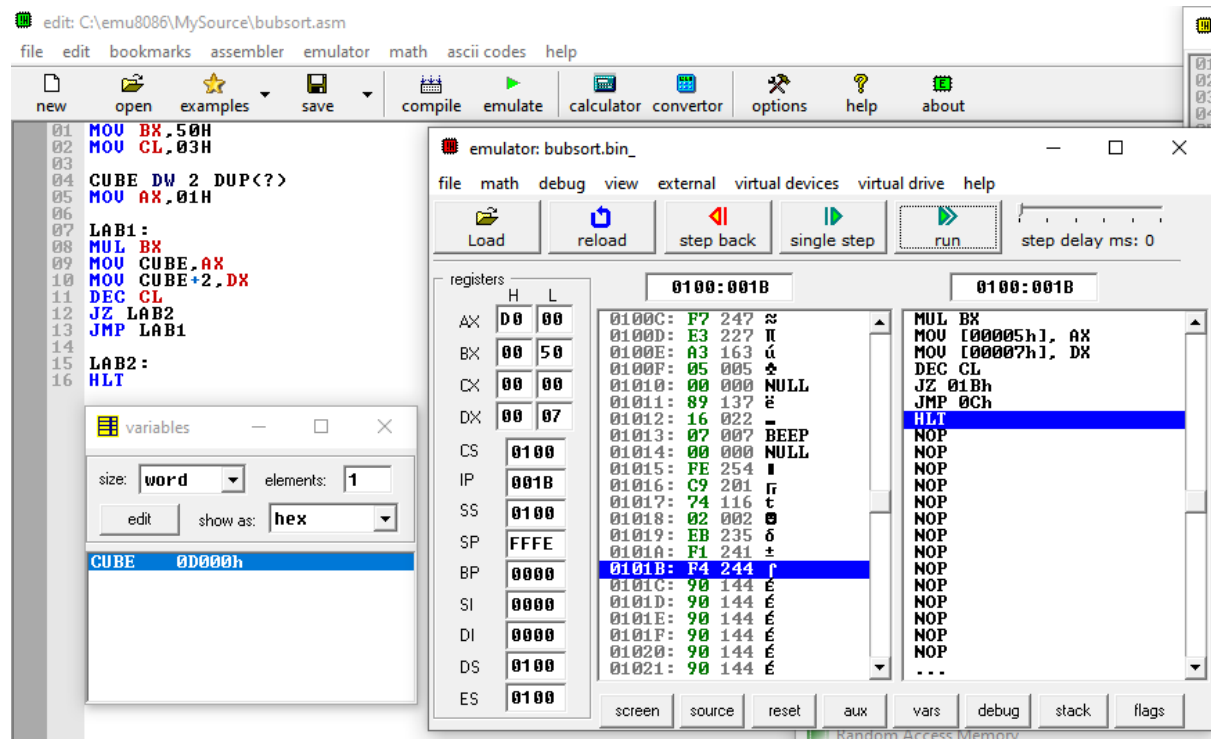
PRN NO. : 2020033800099043

JMP LAB1

LAB2:

HLT

OUTPUT:



5. Write a program to find factorial of a given 8 – bit number.

FACT DW 09H

MOV AX,FACT

LAB1:

DEC FACT

JZ LAB2

MUL FACT

JMP LAB1

LAB2:

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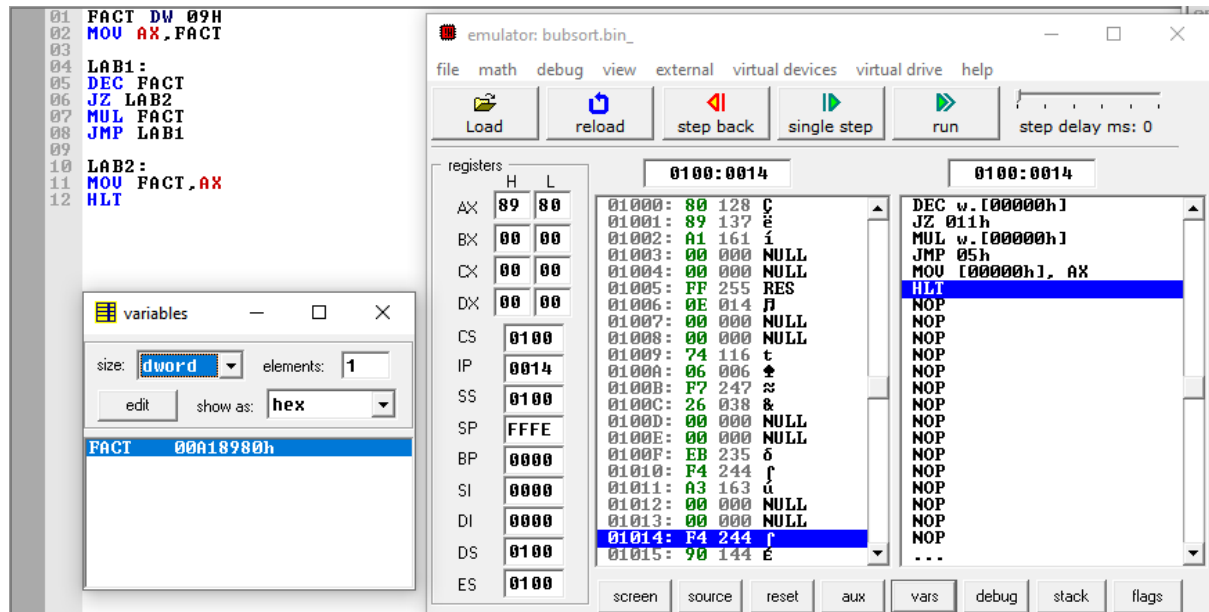
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MOV FACT,AX

HLT

OUTPUT:



6. Write a program to find LCM of 2 16 – bit numbers.

MAIN PROC

MOV CX, 000FH

MOV AX, 000AH

COMP:

CALL GCD

MOV CX, 000FH

MOV AX, 000AH

MOV DX, 0000H

MUL CX

DIV BX

ENDP

HLT

GCD PROC

LABEL:

SUBJECT : MAI

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```
MOV DX, 0000H
DIV CX
MOV BX, CX
MOV AX, CX
MOV CX, DX
```

```
CMP DX, 0000H
JNZ LABEL
```

RET

ENDP

OUTPUT :

The screenshot displays the emu8086 emulator interface. The top menu bar includes 'file', 'edit', 'bookmarks', 'assembler', and 'emulator'. Below the menu is a toolbar with icons for 'new', 'open', 'examples', and 'save'. The main window is divided into several panes:

- Assembly Code Pane:** Shows the assembly code being executed. The code is as follows:


```

01 MAIN PROC
02 MOV CX, 000FH
03 MOV AX, 000AH
04
05 COMP:
06
07 CALL GCD
08
09 MOV CX, 000FH
10 MOV DX, 000AH
11 MOV DX, 0000H
12 MUL CX
13
14 DIV BX
15
16 ENDP
17 HLT
18
19
20 GCD PROC
21 LABEL:
22 MOV DX, 0000H
23 DIV CX
24 MOV BX, CX
25 MOV AX, CX
26 MOV CX, DX
27
28 CMP DX, 0000H
29 JNZ LABEL
30
31 RET
32
33 ENDP
      
```
- Registers Pane:** Displays the current values of the 8086 registers:

Register	Value
AX	00 1E
BX	00 05
CX	00 0F
DX	00 00
SI	0100
DI	0016
BP	0100
SP	FFFE
IP	0000
CS	0000
DS	0000
ES	0100
- Disassembly Pane:** Shows the disassembled instructions for the current address (0100:0016):

Address	Disassembly
01009: B9 185	MOV CX, 0000Fh
0100A: 0F 015	MOV AX, 0000Ah
0100B: 00 000	MOV DX, 00000h
0100C: B8 184	MUL CX
0100D: 0A 010	DIV BX
0100E: 00 000	HLT
0100F: B8 186	MOV DX, 00000h
01010: 00 000	DIV CX
01011: 00 000	MOV AX, CX
01012: F7 247	MOV AX, CX
01013: E1 225	MOV CX, DX
01014: F7 247	CMP DX, 00h
01015: F3 243	JNE 017h
01016: F4 244	RET
01017: B8 186	NOP
01018: 00 000	NOP
01019: 00 000	NOP
0101A: F7 247	NOP
0101B: F1 241	NOP
0101C: 8B 139	NOP
0101D: D9 217	NOP
0101E: 8B 139	...
- Random Access Memory Pane:** Displays a memory dump for the address range 0100:0100 to 0100:0160. The data is shown in hexadecimal and ASCII format.

Address	Hex	ASCII
0100:0100	00 00 00 00 00 00 00 00	00-00 00 00 00 00 00 00 00
0100:0110	00 00 00 00 00 00 00 00	00-00 00 00 00 00 00 00 00
0100:0120	00 00 00 00 00 00 00 00	00-00 00 00 00 00 00 00 00
0100:0130	00 00 00 00 00 00 00 00	00-00 00 00 00 00 00 00 00
0100:0140	00 00 00 00 00 00 00 00	00-00 00 00 00 00 00 00 00
0100:0150	00 00 00 00 00 00 00 00	00-00 00 00 00 00 00 00 00
0100:0160	00 00 00 00 00 00 00 00	00-00 00 00 00 00 00 00 00

The bottom status bar shows the current address (0100:0100) and the instruction being executed (update).